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MONDAY, OCTOBER 17, 1921

WHOLE NO. 399

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# The Classical Weekly

VOL. XV. No. 3

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## THE TRAGEDY OF LATINUS<sup>1</sup>

Even a casual reader of Vergil's Aeneid does not fail to recognize, among the many evidences of the poet's familiarity with Greek tragedy, the Bacchic frenzy of Amata and her Latin women and the suicide by hanging which ends the life of the unhappy queen<sup>2</sup>. A more thoughtful reader notes also how tragically the story ends for the modest princess, Lavinia; for, as Mr. Warde Fowler points out<sup>3</sup>, it was probably a genuine love-match between Lavinia and Turnus. Therefore, when her beautiful, impetuous young lover is slain and leaves the girl to be the bride of Aeneas, middle-aged and *pius*, one feels with fresh poignancy the cruel lot of princesses, ancient and modern. But most tragic of all is Latinus, whose clear and correct convictions always just fail to materialize in action; aghast and hesitating still he stands at his last appearance in the story (12. 656-658). All his impressive grandeur becomes abject and pitiable helplessness when once he ceases to be ruling *in placida pace*.

But, even though one may have felt a tragic quality in all the members of this family, including the only son who had died in youth, one does not ordinarily realize how dramatic is the form in which Vergil has cast their story. Almost of itself the tale of the house of Latinus falls into a tragic drama in five acts. It supplies to the latter half of the Aeneid<sup>4</sup> what the Dido story contributed to the earlier half, and both tragedies follow with perfect naturalness in the wake of a hero whose almost superhuman singleness of purpose keeps him to the goal set by fate. The Latinus tragedy is more thoroughly wrought into the fabric of the Aeneid than is the episodic Dido story. On the very night of the fall of Troy the shade of Creusa foretells (2. 780-784) the long wanderings which are to end in Hesperia by Lydian Tiber, where a prosperous

kingdom and a royal bride are already prepared for Aeneas. There is not one of the first six books of the poem in which we do not hear more or less of the goal of the Trojans, the city Lavinium, the *gens dura atque aspera cultu* which must be conquered in that Western land, so that, when the Latinus-drama opens in Book 7, we know at once that we have finally reached the scene of those events foretold from the beginning of the wanderings.

I have said that the story of the house of Latinus falls almost of itself into a tragic drama in five acts. The reason why this fact does not swiftly disclose itself to the reader is that, in their connection with the whole poem, the events involving Latinus's family are necessarily rather long-drawn-out, and it is only in a rapid reading of the latter six books that one becomes aware of the drama which they include; whereas the Dido story is much more compactly narrated, all its essential parts being closely knit together in Book 4 and a part of Book 1. From the following outline of the drama which can be constructed about Latinus on the basis of Vergil's narrative, it will be apparent that the compiler of such a drama need make only a few changes in the Latin poet's own words, changes so slight and insignificant as to be practically negligible.

The setting of the drama is given in a prologue of sixty-four lines, early in Book 7 (36-40; 45-84; 96-106; 148-155), relating the essential facts about all the principal characters: Latinus, his origin and his status; the portents involving his daughter's future; Amata's passionate support of the suitor, Turnus; the landing of Aeneas and the sending of one hundred Trojan *oratores* to Latinus, to bear gifts and to ask that a peaceful reception to Latium be granted to the strangers.

Act I consists of two scenes, the first in the ancient audience-chamber<sup>5</sup> of the Latin kings. In the first scene, Latinus, sitting on his throne, has summoned to his presence the Trojan *oratores* (7. 192-193). He asks them (195-198) why they have come to Ausonia. He bids them (199-211) accept hospitality from the descendants of Saturn; it was from these fields that their ancestor, Dardanus, had emigrated Eastward. Ilioneus, in his accustomed rôle as spokesman for the Trojans, replies (213-248), telling of their origin, their wanderings, their leader, of the great cataclysmic war in which Europe and Asia had met, of the desire of the Trojans for a scanty abode on this shore they have at last reached, for only in Latium are they permitted by

<sup>1</sup>This paper was read at the Fifteenth Annual Meeting of The Classical Association of the Atlantic States, held at Hunter College, April 23, 1921.

<sup>2</sup>In his recent work, *Vergile et les Origines d'Ostie* (Paris, 1919), Carcopino argues (pages 363-387) that Vergil has borrowed from a priestess of the early cults of Lavinium the name and the traits of Amata, and that the orgies over which the queen presides are taken from a local festival, the Liberalia of Lavinium, in which a goddess of fertility was worshipped by maidens and had as her symbol a divine serpent. The parallels in appearance and behavior between this early priestess and Queen Amata are ingeniously worked out, but they are pushed to an extreme limit. Carcopino himself claims nothing more than that these rites furnished Vergil with 'local color' in the Amata episode; he seems not to question the influence of Greek models (363-364).

<sup>3</sup>The Death of Turnus, 40-41.

<sup>4</sup>Probably no one will deny that Turnus is the tragic figure of the last six books of the Aeneid (on this point see Professor E. K. Rand's paper, *Vergil and the Drama*, The Classical Journal 4-51-61, especially 56-58, 60). Moreover, Vergil's dramatic sense is everywhere apparent in his treatment of Turnus, but Turnus's story does not fall into the form of a tragic drama to any such extent as does the Latinus story. In a word, to one making, as I am in this paper, a point of Vergil's technique, the Latinus story is far more significant than is that of Turnus.

<sup>5</sup>Of the building in which this chamber was we have a detailed description in 7. 168-186. It was the palace of Picus, partly *curia*, partly *templum*, and was situated on the highest ground of the city. It is not plain whether or not the palace of Latinus which is the site of Act I, Scene 2 (7. 341 ff.) was connected with this building, or was an entirely different building.

the Fates to rest. After careful thought (249-258) Latinus joyfully grants their request, accepts their gifts, and declares his belief that Aeneas is the husband destined for his daughter (259-273). He dismisses the *oratores* with the gift of a chariot and a pair of fire-breathing steeds for Aeneas, and with sleek, richly-caparisoned horses for all the *oratores* (274-285).

In Scene 2 Amata enters, already slightly under the influence of the Fury, Allecto, whom Juno has sent (7. 323 ff.) to sow discord and to cheat the Trojans of their longed-for rest. Amata tearfully protests (357-379) to Latinus at giving their daughter to exile Trojans, at breaking his word plighted to Turnus, who can, quite as truly as Aeneas, claim foreign origin, if the Fates require this. Failing to move her husband, and being more and more permeated by the influence of the Fury, the maddened queen rushes through the city to the forest, where she will hide her daughter (375-388). The Latin women, also maddened, follow Amata, who carries a blazing torch and, crying *Euo Bacche*, bids her train join her orgies (389-405)<sup>6</sup>.

In Act II we have a complete and dramatic reversal of the situation presented in Act I. The first of the two scenes takes place at midnight in the lofty chamber of Turnus at Ardea (7. 406-414)<sup>7</sup>. The Fury, Allecto, appears to him in a dream. She has assumed the form of a wrinkled old woman, Calybe, priestess of Juno; her white hair is bound with a fillet and with sacerdotal olive (415-420). She warns Turnus (421-434) that Latinus is discarding him for a strange son-in-law, that Turnus must arm himself and show his real power to Latinus. With characteristic impatience the youth bids the old woman stop inventing fears, since royal Juno is not careless of his interests; let Calybe mind her temple-duties and leave wars for warriors (436-444). Then the Fury in the old woman blazes up (445); the young warrior is terrified at her flaming eyes and the hissing serpents that raise themselves in her hair (446-451). As she announces her true nature and fixes her smoking torches in his breast, the maddened youth awakes and rushes forth, calling for his arms and his men and declaring that he is a match for both Trojans and Latins (452-470).

The second scene of Act II takes place before the palace of Turnus. A company of shepherds enter, bearing the dead bodies of Almo and Galaesus (7. 573-575), entreating the gods and calling Latinus to witness what has happened. He appears from the palace, and one of the shepherds tells<sup>8</sup> about the wounding of Sylvia's pet stag and the resulting fight between Trojans and Latins (483-504; 519-539). Turnus rushes in and cries that the Trojans are being called to a share in the kingdom, while he is being repulsed (577-579). All surround the palace and denounce war (583-585). Firm as a rock at first Latinus ultimately yields and cries:

<sup>6</sup>Dramatic force is gained by thus compressing the action of these thirty lines (7. 375-405), and no real violence is thereby done to the narrative.

<sup>7</sup>This is the only scene which does not occur in Latinus's city or close to its walls.

In the Aeneid this narrative is related by the poet.

'Broken, alas! by fate are we and borne along by the blast of the storm. You, O my wretched people, shall pay the penalty for this with accursed blood. For you, O Turnus, impious thought, for you sad punishment shall be in store and with your vows will you honor the gods too late. For me, my rest is secured. I am on the harbor's edge. Of a happy death am I being robbed'.

Then the king shuts himself up in the palace and abandons control of things (586-600). The gates of war are opened and clans gather for the great conflict (601-817)<sup>9</sup>.

Act III, though the longest of all the acts, consists of a single scene in the palace of Latinus. The Latini have suffered defeat in the great battle of Book 10. The armistice which Aeneas has granted (11. 100-138) for the burial of the dead is not yet over. In the city women and children are weeping and cursing the war and the marriage of Turnus; he, they say, should fight it out himself (11. 213-219); Drances is especially vehement in this demand (220-221). Others, however, take Turnus's part, as a result of the influence of the queen and the fame of his own brave deeds (222-224). In the midst of this tumult *legati* arrive, bearing Diomede's unfavorable reply to the Latin request for aid against the Trojans (225-230). *Deficit ingenti luctu rex ipse Latinus* (231); he summons many leaders to a council and presides *haud laeta fronte* (234-238). He bids (238-240) Venus tell everything that Diomede had said. Briefly, the Greek had refused to help against the Trojans because he and all who ever had opposed them had found them such terrible foes; he advised the *legati* to bear to Aeneas the gifts which they had brought to him and to be warned by the testimony of one who knew whereof he spoke (252-293). When the murmur of the people subsides (296-300), Latinus speaks (301-335) from the throne, regretting that they must deliberate about their policy when the enemy is already at their gates. He blames no one for the situation; he is himself still uncertain what to do, but he will set forth what seems to him wise. He would offer the Trojans this choice, land on which to settle, or ships in which to sail away from Latium. This offer he would make through one hundred *oratores*, *prima de gente*, bearing gifts of gold and ivory and the *sella* and the *trabea*, *insignia* of the Latin power.

Then Drances, whose envy of Turnus goads him on, warmly supports this proposition of the king (334-335), and attacks Turnus as the cause of all their troubles (346-375). 'The war has been for Turnus's personal, selfish ends. Why should so many men die for him? Let Turnus fight for himself!'. At these words the *violentia* of Turnus breaks forth (378-444) against 'the windy wordiness of Drances and his faintheartedness. The Latins may yet win the day. Even if Diomede refuses aid, there are Messapus and Tolumnius and many other leaders, especially the Volscian Camilla with her gleaming squadrons. But, if the Trojans desire a combat between Aeneas and Turnus, Turnus is ready for that'.

<sup>9</sup>The conclusion of this scene can be made more or less elaborate according to the period of drama which one has in mind.

While this dispute is going on, word comes (445-450) that the Trojans are drawn up in line from the Tiber and the Tuscans are descending through the plain. There is great confusion, a hasty call to arms by warriors, a tremulous weeping of the *patres* (451-458). Turnus, seizing the critical moment, rushes from the council, with these brief but scornful words—cogite concilium et pacem laudate sedentes: illi armis in regna ruunt (459-461). The meeting is broken up by the departure of Latinus, accusing himself of not having received Aeneas as his son-in-law (469-472). The trumpet-call to battle sounds, a procession of women passes, going to the temple of Pallas and chanting a prayer to her (473-485)<sup>10</sup>.

Act IV shows the palace of Turnus again, just after the second great defeat, described in Book II. Turnus sees (12. 1-9) that the time for his single combat with Aeneas has come. Excitedly he addresses Latinus (10-17), saying that there is no delay in Turnus, no excuse for the Trojans to break their contract; Latinus must sacrifice and seal a treaty; Turnus will send Aeneas down to Tartarus or else Aeneas shall be victor and have Lavinia as his wife. Quietly Latinus reasons with Turnus (19-45), reminding the youth that he has a splendid realm from his father, Daunus, which he himself has increased by victories. Latinus is willing to give him gold and there are other highborn virgins in Latium besides Lavinia.

'It had been against the will of heaven for Latinus to give his daughter to any of the Italian nobles; weakness had caused him to yield to the tears of Amata<sup>11</sup> and all the disasters of the succeeding conflict had been due to this impiety. If Turnus is killed, Latinus will then make an alliance with the Trojans. Why should he not do it at once? The Rutuli and all Italy will not pardon Latinus for the death of their prince and aged Daunus deserves pity'.

Stiffly the youth bids Latinus 'lay aside his care for Turnus, who knows how to deal bloody blows. Even Aeneas's goddess-mother will not be at hand with her protecting cloud'. Amata, terrified and weeping, clings to Turnus (54-55) and begs him (56-63) not to fight the Trojans, for he is the safety of the kingdom of Latinus: if Turnus dies, she will die too. The youth fixes his gaze on the blushing Lavinia, but his heart, though stirred by love, burns the more for war (64-71). He bids Amata (72-80) not to send him into battle with such an unhappy omen: Idmon is ordered to announce to Aeneas that Turnus will be ready for the combat at dawn. Turnus rushes *in tecta* and demands his swift horses (81-82).

In Act V we have the speedy culmination of the tragedy foreshadowed in Act IV. The first scene occurs close to the city walls (12. 116), where a space has been measured off for the combat of Aeneas and Turnus. In the center are grassy altars; attendants are bringing fire and water, *velati limo et verbena*

*tempora vincti* (119-120). Both armies are assembled here before dawn (113; 172); the leading men hurry to and fro, in gold and purple (126); old men, women, and children crowd the walls and the roofs of the city (131-133). Onto the field come riding in their chariots Latinus, in a gleaming crown with twelve golden rays, and Turnus, brandishing his iron spears (161-165), on the other side Aeneas, in his celestial arms, with young Ascanius (166-169). A priest in unspotted raiment begins the sacrifice and the solemn ceremony (169-171). With drawn sword Aeneas prays, declaring that, if victory comes to Turnus, the Trojans will retire to Evander's city and never trouble the Latins more; if Aeneas wins, Latins and Trojans shall be united on equal terms, Latinus the military head, Aeneas the religious head of the State. With equal solemnity Latinus swears (197-211) to abide by these terms; he swears by earth and sea and stars, by the two-fold offspring of Latona, by Janus and the power of the gods below, by Jove of the thunderbolt.

The sacrifice is finished, the *reges* depart, when (Scene 2) Turnus quietly approaches the altar, pale, with downcast eyes (218-221). Then his sister, Juturna, in the form of a warrior (222-224), taunts (229-237) the Rutuli with 'letting one man risk his life for all of them. By this means Turnus will win immortal glory, while they will become slaves of the Trojans'. The people call for arms, wish that the treaty had not been made, and pity the unjust fate of Turnus (241-243). Then occurs the portent<sup>12</sup> of the swar and the eagle, than which nothing could have been better calculated to incite the murmuring host to break the treaty so solemnly sealed in the preceding scene. Immediately Tolumnius, augur, crying that this is the answer to his prayers, bids the people seize their weapons and defend their prince (258-265). Running forward, he hurls his spear among the enemy. In a moment battle is precipitated (266-269), the altars are torn to pieces (283), and there is a rain of weapons (284). Latinus is seen fleeing, 'bearing off his routed gods, the treaty all undone' (285-286).

The last scene brings us back to the palace of Latinus. From outside is heard the noise of the attack and of the people who swarm in like bees (575-592)<sup>13</sup>. Some are for opening the gates to the enemy, others wish to defend the walls (584-586)<sup>14</sup>. A woman-servant<sup>15</sup> enters and relates the suicide of Queen Amata (595-603). There is a wailing from the Latin women, Lavinia tears her hair and disfigures her beautiful cheeks, the whole house resounds with weeping (604-607). Latinus rends his garments, casts dust on his snow-white locks (609-611) and, doubtful and hesitating to the end, cries<sup>16</sup>, in utter helplessness:

<sup>10</sup>In Vergil's narrative this prayer is uttered at the temple.  
<sup>11</sup>Is this true? We do not hear that Amata is even present in the scene where Latinus yields to the demand for war (7. 573-600).

<sup>12</sup>Because of the difficulty of showing the portent on the stage, the poet's account of it may be related by Juturna, who can report it as just witnessed by herself.

<sup>13</sup>In Vergil's narrative these things do not occur in the palace.

<sup>14</sup>The woman-servant may be employed to relate what the poet himself has told in the Aeneid.

<sup>15</sup>The following cry of Latinus is an adaptation of Aen. 12. 610, 658.

coniugis attonitus fatis urbisque ruina  
quos generos vocem ego aut quae nunc me ad foedera  
flectam?

From this simple exposition of Vergil's treatment of the story of Latinus it is evident that in plot and in characterization the tale meets the chief requirements of a tragedy. The action is in or near the city of Latinus, save in the scene which takes place at Ardea. The most obvious weakness of the proposed drama is in the essential nature of Latinus. Sheer futility is tragic, but so negative a quality lacks dramatic force. The wavering purpose is Euripidean, but the conventional tragic hero is hardly so lacking in self-assertion.

That a five-act drama does thus emerge from the larger story of the Trojan conquest of Latium does not necessarily imply that the poet was influenced by some existing tragedy on this theme or that he was even aware of the striking resemblances between his narrative and a drama. We may rather conclude that, in addition to a familiarity with classical drama, the poet himself had to an unusual degree that keen sense of the importance of dramatic form which we know to have characterized Greek and Roman writers in general, even prose writers of orations and of philosophical dialogues<sup>16</sup>.

VASSAR COLLEGE

CATHARINE SAUNDERS

## REVIEW

*Antike Technik. Sieben Vorträge von Hermann Diels.* Zweite, Erweiterte Auflage, mit 78 Abbildungen, 18 Tafeln, und 1 Titelbild. Leipzig und Berlin: B. G. Teubner (1920).

The author, whose life has passed the limit prescribed by the psalmist, has published several valuable works on Greek writers and Hellenic affairs, and comes well equipped for the task he has undertaken in the present instance.

The book is not intended as a general treatise, but is a collection of searching investigations of selected topics (an analogous plan is followed in some of these special investigations, some particular point being elaborated). Constant reference is made to the works of others, very many of which are of recent date. Of course, for obvious reasons, most of the authorities referred to are German, but foreign works are not ignored as such; we find French authorities cited often, and sometimes English and American, not to mention others.

<sup>16</sup>For a recent treatment of this characteristic see Dramatic Interpretation in the Teaching of the Classics, by Gonzalez Lodge, Teachers College Record 21, 217-237 (May, 1920), reprinted in THE CLASSICAL WEEKLY 14, 73-77, 81-85. For Vergil, reference may be made to an editorial, The Aeneid as a Tragedy: Dido, A Latin Tragedy, THE CLASSICAL WEEKLY 8, 169-170, especially to the bibliography of this theme given on page 170, and to H. O. Ryder, A Miniature Drama: Aeneid 1.338-368. THE CLASSICAL WEEKLY 11, 175-176.

In his researches the author employs all available means of avoiding erroneous conclusions. When he is dealing with matters that lie outside of his field, he calls specialists to his aid. Especially in the preparation of models of ancient mechanisms was this care important. The results of his investigations, thus interpreted and executed by experts, are such that visitors to European collections need to be warned against the danger of being misled by totally erroneous models or 'restorations'. For instance, we learn that Napoleon appointed a philologist and a general to study the texts and construct models of the ancient 'artillery'.

Leider arbeiteten beide, die sehr eigensinnig waren, nicht gut zusammen. So sind die grossen Geschützmodelle, die noch heute im Museum St. Germain aufgestellt sind, wenig mehr als moderne Phantasiekonstruktionen.

Another instance is the model of a water clock in the Deutsches Museum in Munich, which is "äusserlich glänzend, aber innerlich völlig verfehlt".

One feature of the work deserves special commendation: it contains abundance of illustrations, many of which are photogravures. Without these the book would be like a geometry without diagrams.

The work proper consists of an address before the Marburg Philological Assembly, four lectures at the Salzburg Hochschule, an address before the Archaeological Society (in Berlin), March 4, 1913, and, finally, the substance of an address before the Prussian Academy of Sciences, July 19, 1917.

The Preface to the first edition is dated Easter, 1914, that to the second, Easter, 1919. In the first is stated the object of the work, to do something toward bringing together the antagonistic parties consisting of those who have contempt for things ancient and those who devote themselves to the study of antiquity, and to aid even the latter to a better understanding of the progress made by the ancients in things material. The author emphasizes the necessity of cooperation between the idealism of scholars and the realism of scientists and mechanicians.

An attempt to give a practically useful epitome of the work would be idle. Only so much will be said on the treatment of each topic as is necessary to convey some idea of the character of the book.

### I. Wissenschaft und Technik bei den Griechen

Passing over prehistoric matters, the author begins with Thales and discusses concisely the theories and the achievements of Anaximander, Cleostratus, Harpalus, Mandrocles, Pythagoras, Eupalinus, Heraclitus, Hippodamus, Polycletus, etc. The tunnel made by Eupalinus to convey water through Mt. Athos to the city of Samas is illustrated by means of a map, and by the diagram of Hero showing how the calculations were made for cutting a tunnel from both ends. There is reason to believe that Hero may have had this very tunnel in mind.

The far-reaching influence of the School of Miletus is discussed, and the 'artillery' of the Greeks is described and its history investigated, especially its employment by Dionysius the Elder. Then follows a similar treatment of the School of Pythagoras in particular, considerable space being given to medicine and surgery. One illustration in the course of this discussion is a photogravure of a bit of papyrus from which alone was learned the name, Diades, of the great mechanical engineer who served under Alexander at the siege and capture of Tyre and other cities. There is here also a sensible discussion of the causes that led to the contempt of the ancients for craftsmen and artificers of all sorts, among whom they classed physicians, surgeons, engineers, and the like. To this contempt there was one exception, Archimedes. The reasons for his becoming famous are discussed, and an account is given of his mathematical and mechanical achievements. Here such men as Archimedes are commended, and the necessity of theory and practice, pure science and applied science going hand in hand, is elaborated.

### II. *Antike Türen und Schlösser*

Beginning with Homer, the author devotes fifteen pages to descriptions and illustrations of ancient, especially Greek, doors and locks. Many of the illustrations are taken from ancient representations. The ingenuity displayed in devising locks and keys is in no degree inferior to that of the present day.

### III. *Dampfmaschine, Automat, Taxameter*

This lecture is devoted almost entirely to Hero of Alexandria. Those who are familiar with Wilmowitz-Moellendorff's Griechisches Lesebuch are acquainted with most of the topics here treated, but it may be worth while to enumerate them.

(1) Hero's Ball, from which water was forced out by compressed air—a principle already employed in the construction of the fire-engine by Ctesibius, and virtually in use at the present day.

(2) Hero's Steam Sphere, caused to rotate by the retroaction of escaping steam (three illustrations).

(3) Automata. Here considerable space is given to an account of the performance of a play by automata in a theater—the ancient 'moving pictures'.

(4) The Hodometer. The description given by Hero is reproduced in full. The wheel of a vehicle sets in motion a series of cog wheels, like clock-work, which record the rotations of the carefully measured wheel, and so give the distance passed over. The instrument resembles our gas-meters. Vitruvius describes an instrument (similar to the hodometer) which indicated the distance in a different way, and adds that it may be used in navigation.

(5) Holy Water automaton: the first slot-machine. A coin dropped through a hole opens a valve by means of a lever and lets the water flow for a brief moment. It seems not to be known whether the inventor of the modern slot-machine got his idea from Hero or not.

### IV. *Antike Telegraphie*

This lecture begins with an account of secret communications between persons at a distance from each other. The first instance recorded in Greek literature was the famous folded tablet of Iliad 6.169. The *skylake* is discussed and explained. In the course of time additional means of communication were devised. Aeneas Tacticus enumerates sixteen different methods, one of which is illustrated by a diagram. But he does not mention the carrier pigeons, though it is well established that they were already in use in the fifth century B. C. Fire-signalling is discussed, and a map shows the line of signal stations from Troy to Mycenae, according to Aeschylus in the Agamemnon<sup>1</sup>. Of course the details here are treated as fictitious, but it is contended that some such line of stations may have existed. Such signalling required a prearrangement between sender and receiver of messages. Means of overcoming this difficulty are mentioned and discussed, especially the system described by Polybius 10.45. Then follows a brief sketch of telegraphy down to what is now understood by 'telegraphy' and 'signalling', closing with mention of the employment of intense lights even by day, as was done by the Germans in 1914-1918. At the end of that period improvements were made which have been kept secret.

### V. *Die Antike Artillerie*

Our knowledge of the ancient machines of warfare is derived partly from historians, but chiefly from writers on the subject, especially Philo, of Byzantium, and Hero. The results of earlier attempts to reconstruct, from these sources, such machines, even including the attempt instituted by Napoleon III, were not entirely satisfactory. But, recently, General E. A. Schramm, aided by the late Dr. Rudolf Schneider, as linguist, is believed to have achieved practically perfect restorations. As the ancient machines were made chiefly of wood, very few remains of them have survived, but many projectiles (balls) and some arrow-points have been found.

The large machines ('artillery') were formerly believed to have been invented by the Jews, since this is expressly stated in II Chronicles 26.15; but it is now believed that the author of this book lived about 500 years after the events he narrates, and that he committed an anachronism.

The bow and arrow have been in practically universal use from time immemorial. From the bow arose the cross-bow, certainly in use in the Roman period, and, no doubt, earlier in Greece. The failure of the historians to mention it is probably due to the fact that it was used in hunting rather than in warfare. The Greek writers begin with the γαστραφέτης (a word not found in Liddell and Scott), which was an enlarge-

<sup>1</sup>Reference may be made to a paper, 32 pages long, by Augustus C. Merriam (formerly Professor at Columbia University), entitled Telegraphing Among the Ancients. This was published as No. I of Classical Series III of the papers of the Archaeological Institute of America (Cambridge, John Wilson and Sons, 1890). On pages 24-32, Professor Merriam discussed the "Problem of the Line of Beacon-Fires", Aeschylus, Agamemnon 281-316. C. K.

ment of the crossbow, with resulting modifications. In Diels's book it is fully described, with illustrations. Here our author inserts a description, with illustration, of a war-engine derived from the sling—the *μονάγκων*, or *onager*, as the Romans called it.

The catapults proper are now discussed. It is not possible here to make a useful abstract of this very interesting part of the work. Suffice it to say that the subject is treated with clearness and thoroughness from every point of view, though an artillerist might wish that the author had collected all the data bearing on caliber and range. These are carefully considered, but there seems to be no mention of the *ταλαντίας περιβόλλος* (or *λιθοβόλλος*), a '60-pounder', with an effective range of only about 600 feet, according to Philo, who says it was the most powerful of the siege-pieces.

The latter part of the lecture brings the history down to and including the invention of gunpowder and its application—the invention of the cannon.

Diesen bedeutenden Fortschritt verdanken wir weder den Arabern, . . . noch den Chinesen, sondern den Deutschen, die bei Byzantinern wie Italienern als die Erfinder der neuen 'barbarischen' Technik angesehen wurden.

In this part of the lecture there is an interesting discussion of the steam cannon ascribed to Archimedes, with the illustrations made by Leonardo da Vinci. The author believes that the story of this invention originated among the Arabians, who are known to have made other forgeries under the name of Archimedes.

The lecture closes with an able justification of the destructive inventions of the Germans. A footnote states that this justification was written just as it stands before the Great War broke out.

#### VI. Antike Chemie

The origin of the name of this science is minutely investigated. The author believes that it originated from *χῦμα*, 'Metallguss', so that *chymie* would be more accurate than *chemie* (some of us can remember when it was often called *chymistry* even by scientists). Then follows a most laborious and painstaking investigation of the alchemistic literature in ancient times, when an important part was played by a large work forged under the name of Democritus. The conclusion is that the mystic character of ancient chemistry, that is, what we call alchemy, originated from a Hellenic source, and specifically in the Pythagorizing circles of Egypt.

The earliest extant records of what may be called chemistry are now taken up. These are two papyri found in an Egyptian grave in 1828; they belong to the third century after Christ. The writing is beautiful, the spelling very bad. One of these papyri lay in Leyden, virtually buried, until 1885, when it was published; the other, after some roaming, found its way to Upsala, where it was published in 1913. The first reveals the secrets of the Egyptian falsification of metals and of purple dyeing; the other treats of silver, purple, pearls, and precious stones, chiefly with a view to imitation. The account given here of the

contents of these papyri is exceedingly entertaining, whether one be interested in chemistry and antiquities or not. This account is followed by an investigation of the sources from which the papyri sprung. These papyri and similar documents were strictly secret (the users being bound to secrecy by a solemn oath), not only from the general public, but even from those whom we should call experts. An investigation of this mystery leads to the conclusion that the men possessing and transmitting these secrets were the Egyptian priests.

The lecture concludes with the transition from this art of fraud and deception to the science of chemistry, which may be dated from Lavoisier at the close of the eighteenth century.

#### VII. Die Antike Uhr

This article (enlarged address) of 78 pages constitutes one-third of the entire work. It may safely be pronounced the most trustworthy and complete treatment of the subject that we have.

First the sun-clocks (dials or sun-dials, as we call them) are treated, then the water-clocks (*clepsydrae*). The measuring of time perhaps more than anything else requires a combination of scientific knowledge and mechanical invention. The subject here treated consequently is specially adapted to enabling us to judge of the intellect and the mechanical achievements of the ancients.

A brief account is given of the measurement of the year by the sun and the determination of the month by the moon and of the difficulties growing out of the fact that these units thus measured are not commensurable.

The subdivisions of the day (the day itself being obviously fixed also by the sun) were, in the earlier historical period, very vague among the masses of the people, but scientific men in Egypt, Babylon, and China had been for two thousand years making observations on the sun, and the sun-dial was introduced from Babylon by Anaximander. The shadow of the gnomon by its varying length indicated the time of year and determined the seasons and the whole year, and furnished means of ascertaining the obliquity of the ecliptic, which was observed by Anaximander.

In classical literature there is repeated mention of estimating the time of day by the length of one's own shadow. This, of course, depended on the latitude and the time of year, and there is extant a work of Palladius (fourth century A. D.) containing hour-tables for measuring the hours in this way.

The sun-clock, which measured hours as well as seasons, seems to have established itself in Greece during the fifth and fourth centuries B. C., and must have been used by such men as Oenopides and Meton. Dionysius the Elder, of Syracuse, had a large one constructed. Eudoxus of Cnidus (408-335) invented an improvement on the then existing sun-clocks. He spent several years in Athens in association with Aristotle and other pupils of Plato. It is noteworthy

that in the famous mosaic of Torre Annunziata (a picture of which forms the frontispiece of this book), representing Plato teaching in the Academia, a sun-clock is seen at the top of a column.

Our sun-dials are very easy to make for a given latitude, whereas the ancients were confronted by difficulties arising from the fact that daytime, that is, from sunrise till sunset, was divided into twelve equal parts for each day, so that these parts ('hours') varied in length from day to day, the average length being that of the equinoctial hour. Hence the scientifically constructed clocks of the ancients indicated the time of year and the hour-lengths for that date—a process requiring the use of curves, which at first were probably empiric, but later were made on geometrical principles resulting sometimes in conic sections.

Not only were stationary clocks constructed, but portable clocks were devised for any latitude, and for travel generally. Several men, otherwise known for genius, took part in the improvement of these clocks.

We have ancient descriptions of sun-clocks, and these clocks are found on many walls and in excavations. The work before us carefully classifies them according to plans of construction (of which there is a considerable number), describes them minutely, and furnishes about twenty-five illustrations, some of them photogravures.

For cloudy weather and night time and for indoor use, as in court-rooms, some other means of measuring time were necessary. Hence originated, not later than the fifth century B. C., the *clepsydra*, or water-clock, which worked on the same principle as the sand-glass or hour-glass, which was in general use a century ago, and still lingers in some places, that is, the time is measured by the flow of water through a small opening, usually a tube.

The name *clepsydra*, 'water-thief' (humorously bestowed, as is often done in such cases), was transferred to the water-clock from a kitchen utensil, erroneously treated in some of our books as a species of the water-clock. It was a vessel entirely closed, except that it had many very small perforations in the bottom, like a colander, and a hole in the handle small enough to be covered by the thumb. The handle of some was a long slender vertical neck open at the top, that of others an arch attached at both ends, with a hole at the summit. When pressed down into water it soon filled, excluding large impurities, and then with the air shut off by the thumb it could be carried away without appreciable loss of water. Its theory is said to have been investigated by Anaxagoras.

The treatment of the water-clock is like that of the sun-clock in thoroughness and abundance of illustrations. Only a few striking facts, some of them not known until a recent date, can here be mentioned.

Unlike the sun-clock, the water-clock is capable of putting machinery into operation. The first and perhaps most interesting instance of this was the alarm clock constructed under the direction of Plato, which sounded a note, or, as we should say, blew a

whistle, when the proper time arrived, to arouse and call to work the pupils in the Academia. This clock is reported to have suggested to Ctesibius, the great genius, the invention of the water-organ, and, we may infer, also, the invention of the fire-engine. He was easily the greatest physicist and mechanician of that period; some of his inventions have survived to the present time. He also devised a method of adapting a water-clock to the varying lengths of hours. An ingenious attempt is here made to restore the construction of such a clock with the aid of the rather vague description given by Vitruvius (9. 8. 6). In this connection is described a clock with a dial and hour-hand, mentioned by Vitruvius. To be traced to inventions of Ctesibius are the hour-striking clock ascribed to Archimedes and various clocks that presented at the ends of hours automata comparable to those of modern clocks. Some of them are described, with illustrations, and through analogous clocks of the Middle Ages we are brought down to the famous Strasburg clock, the handiwork of Germans.

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#### THE CLASSICAL MEETING AT CAMBRIDGE, ENGLAND<sup>1</sup>

To a member of the American Philological Association, and of the Regional Classical Associations in America, points of contrast and resemblances between the meeting of The Classical Association of England, at Cambridge, in August last, and classical meetings in America were of interest. The British Classical Association is not a counterpart either of the American Philological Association, or of such a regional Association as The Classical Association of the Atlantic States; rather it combines features of both. Unlike the American Philological Association it is not made up merely of those who teach in Colleges and Universities or are interested in advanced philology. It does, indeed, bring together such persons; most of the distinguished classical scholars are present at the meetings. On the other hand, it draws a large number from among the teachers in the Secondary Schools and from friends of the Classics who have no connection whatever with education. On the whole, then, it resembles our various Regional Classical Associations more than it does the American Philological Association. The foremost English classical scholars feel that here is a good chance to compare notes with the workers in the Secondary Schools and with all who are interested in the advancement of classical studies. One quality of the British papers at such a meeting especially impresses the American observer: their attention to form, to style. Their papers sparkle with wit, with finished phrase. Unless the listener is interested as well as instructed, readers of papers are not satisfied. The results, at the hands of past masters of the art, are striking. 'No dull moments' seems to be the slogan of their meetings. At the meetings of the American Philological Association our

<sup>1</sup>Professor Chase's account of this meeting arrived after Professor Hirst's report of it had been sent to the printer (THE CLASSICAL WEEKLY 15. 7-8). The following extracts from Professor Chase's account are sure to interest many.

scholars are more inclined, probably, to be interested in bringing out the piece of philological work they have on hand; and in twenty minutes there is little time to add ornament to an account of the problem under consideration.

This matter of time brings up another difference. When the papers run over the appointed time, and no provision is made for discussion, as was the case at Cambridge, it is perhaps not so necessary to have the papers well boiled down. The elimination of all discussion is a high price to pay, however. Several of the brilliant papers presented at Cambridge last August called loudly for discussion. We are wiser in limiting our papers rigidly and in leaving time to discuss them.

Readers of THE CLASSICAL WEEKLY would have been much interested in the debate, led by Professor Harrower, on The Best Method of Strengthening the Position of the Classics. To the Americans present it sounded like ancient history; here is one place where we are older than the English. I need not repeat an argument or a suggestion. You know it all: all the passionate pros and cons. Are archaeology, illustrative material, lantern-slides, special devices to catch interest to be our saviors, or are they but snare and delusion? Will more and better writing of Latin prose and verse turn the trick, or should there be less? Must we be more yielding or more rigid? At first there was a feeling akin to dismay that even our British cousins must come down to such sorry worries as trouble us. We heard of districts where schoolchildren had no chance to study Greek, and where Latin might go the same way. Mr. Wells and all his ilk came in for caustic mention. The British were interested to know with what success we had met these problems in America. But the underlying note was not pessimism. There was merely a call, they felt, to meet with more intelligence and with more enthusiasm problems that could certainly be solved. Probably Professor J. W. Mackail voiced the general feeling when he said that "never were the prospects for the Classics in Great Britain brighter".

The brilliant Presidential address of the great London scholar and banker, Dr. Walter Leaf, should not be left unmentioned. On the one side he himself represented in an eminent way the theme of his paper, Classics and Realities. The various London dailies paid editorial tribute the next day to what he said and what he himself was. In the second half of his address he handled in the neatest possible way Greek banking, a fine piece of work that was generally admired. And I might mention, in passing, that the great English dailies, from London to Manchester, devoted more attention to this one week of classical events in England than would our dailies to those of a year.

I am sure that every American felt that this attempt to bring together the scholars of America and of the British Empire in some form of joint meeting was eminently worth while. We must hope that in due time, perhaps when the American dollar is not so costly, the American Philological Association will in turn invite the British Association. And we shall find that a fast pace has been set for us by the recent meeting. In conclusion, I should like to say how impressive to the observer are the attempts of the English people to work out their problems, educational and otherwise. They are putting forth their very best efforts. I saw this at Oxford in the Congress of the Universities of the Empire, of which I was by courtesy an associate member. Much might also be said of the attempts of Oxford and Cambridge to meet the needs, in graduate study, of young scholars of the Dominions and of America.

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### CORRESPONDENCE ON VERGILIAN DETERMINISM

IN THE CLASSICAL WEEKLY 15.2-5 Professor Pease criticized my contention that the Aeneid does not prove Vergil a Stoic. I should like to call attention to a few of the points where he seems to me not quite to justify his criticism.

(1) In speaking of Vergil's early enthusiasm for epicureanism I had assumed, of course, that Eclogue 6 was written in honor of Siro (see Classical Philology 15.115), that Vergil was the author of the Ciris, with its prooemium, and that Georgics 2.490 ff. referred to Lucretius.

(2) Professor Pease asks (3), "...what shall we do with the philosophy of the Fourth Eclogue (about which Professor Frank is discreetly silent)...?". It would no more occur to me to deduce any philosophy from the references to "secular repetition" in this allegorical poem than to draw biological data from its benevolent lions and pink rams. Surely we have here, as in Aeneid 6, a picturesque setting assumed for artistic purposes.

(3) Professor Pease differs with me (3) concerning *semina flammae*, Aen. 6. 6. Every commentator gives the Homeric parallel, but it is more to the point that Lucretius uses *semina ardoris* and *semina vaporis* in a technical sense. When philosophers—and Vergil was a close student of Lucretius—employ words like 'atom', they naturally think of the current and not of the obsolete usage.

(4) In The Classical Review 34 (1919), 104, I pointed out the Lucretian parallel and the Epicurean connotation of *sole repercuoso*, Aen. 8. 23.

(5) On the identification of Zeus and fate see Professor Pease's excellent commentary on Cicero, De Divinatione 1.125, and the seven authorities there cited.

(6) The hypothetical Unitarian writing a poem on the Immaculate Conception (5) does not seem to me to provide an apposite parallel. The Aeneid is hardly a philosophic poem. My point was that the eschatological setting was incidental to the artistic purpose of bringing the Roman heroes into review. It would be fairer to cite as a parallel a poem like Stephen Phillips' Christ in Hades. Does any reader of Phillips ever assume that the poet actually accepts the medieval legend of the Harrowing of Hell?

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### A BIBLIOGRAPHIC MONOGRAPH ON THE VALUE OF THE CLASSICS

Under the above caption Professor George Depue Hadzsits, of the University of Pennsylvania, and Dr. Lewis R. Harley, Principal of the Girls' High School, Philadelphia, assisted by Miss Jessie E. Allen, Dr. Ethel L. Chubb, Mr. Fred. J. Doolittle, Dr. Edward H. Heffner, Mr. Arthur W. Howes, Miss Edith F. Ricc, and Dr. Elis A. Schnabel have brought out a pamphlet which ought to prove of service to many, even though it makes no claim to exhausting its subject. The pamphlet, which was published by the University of Pennsylvania, was undertaken by the collaborators on behalf of The Philadelphia Society for the Promotion of Liberal Culture.

The contents are as follows: Introduction (Summary of Arguments), 5-6; Part I. General Works on the Value of the Classics (7-8); Part II. On the Value of the Classics (9-16); Part III. On the Influence of the Classics (17-22); Some American Classical League Publications (23-24); Part V. The Classics and Education (25-35).

Copies may be obtained, at ten cents each, from Professor Hadzsits.

C.K.